

VERSION WITH MARKINGS TO SHOW CHANGES MADE:

In the Specification:

The new paragraph inserted on page 2, at line 1, before "Electric Energy is generated ..." follows:

RELATED APPLICATIONS

The present invention is a continuation of U.S. Non-Provisional Application Serial No. 08/516,646, now U.S. Patent No. 6,115,698, filed on August 18, 1995, which issued on a continued prosecution application filed under 37 C.F.R. 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2). The contents of the preceding application are incorporated herein by reference.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 6, at line 17 follows:

[Figures 14 to 27] Figures 14, 15a-15e and 16 to 27 illustrate the various features of the Market View screen which displays transaction and transmission data for either the Current Hour or the Next Hour;

A marked up version of the paragraph replacing the redacted paragraph that begins on page 6, at line 19 follows:

Figure[s] 28 illustrates the Link tab display of each interface-to-interface contract wheeling path across the Participant's system;

A marked up version of the paragraph replacing the redacted paragraph that begins on page 7, at line 2 follows:

Figures 30 to 31 illustrate the Participant's transmission limits including [he] the effects of any wheeling transactions;

A marked up version of the paragraph replacing the redacted paragraph that begins on page 7, at line 10 follows:

Figures 53 to 57 illustrate a Buyer/Seller curtailment of next hour transactions;

A marked up version of the paragraph replacing the redacted paragraph that begins on page 9, at line 8 follows:

Figure 3 illustrates seven Participants and the interconnection model 30 in CPEX. Each Participant is a utility company interconnected by high voltage lines. Each Participant is designated by a mnemonic abbreviation. For example, CIPS (Central Illinois Public Service) 32 is connected to IPC (Illinois Power Company) 34 by high voltage lines. Likewise, CIPS 32 is connected to CILC 42 by lines 44. One should also note that CIPS 32 is connected to IIGE 38 by lines 36 and lines 40. Therefore, if CIPS purchases energy from IIGE, the power is routed at least in part over infrastructure owned by IPC 34. In this situation, IPC 34 is known as a "wheeler." As a wheeler, IPC charges a "wheeling" fee for the use of its infrastructure. This fee is added to the cost of the energy being purchased. Each CPEX Participant must either be a control area or have a contractual arrangement with a control area to provide control area services. In addition, a Participant must have at least one metered or contractual interface with another Participant. In CPEX, Participants are represented as nodes and the transfer capabilities between them as interfaces.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 10, at line 10 follows:

Participants determine and set the transfer capabilities of each interface. Upon becoming Participants in the CPEX market, each Participant must establish a maximum import and export limit for each interface. [These] As shown in Figure 4, these limits are displayed on a computer generated display 46a, 46b. On an ongoing basis, however, each Participant's operators may set the import (In) and export (Out) Hourly Limits at any value between zero and the maximum, based on current operating conditions. As illustrated in Figure 4, the Hourly Limits set by Participants on either side of an interface may be different. For example, CIPS 32 might consider the hourly input limit on its IPC interface to equal 250 megawatt-hours (MWh). However, IPC might consider the hourly

output limit on its CIPS interface to equal 300 MWh. In such a case, CPEX enforces the more restrictive limitation on both Participants. Note that the line limit exceeds the import/export limit. The difference takes into account the amount of energy distributed by the Participant over its lines to its own customers. As Participants accept offers to buy and sell energy, using the CIPS/IPC interface, CPEX indicates the increased scheduling of this interface, as shown by the Hourly Schedule values, and lowers the remaining unused transfer capability by a corresponding amount.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 13, at line 4 follows:

Figure 12 illustrates the program generated display 118 which appears when the Review Path Status button 110, located at the bottom of the "User Maintenance" screen, is selected. This display allows a Participant to review the status of all paths identified to the CPEX system. It also allows the Participant to change the status of a path or paths. Paths may be excluded at the discretion of any Participant for the various reasons. For example, Valid Path indicates that the path is functional. Equipment Outages indicates that the path is temporarily not functional. Insufficient Contracts indicates that the necessary contracts to trade energy are missing. Unreliable Path indicates that the path is deemed nonfunctional. To change the status of a path, the path is first highlighted. Next, the user selects the "Path Status" pull down menu 120. Once a reason other than "Valid" has been selected, the "Starting Date," "Ending Date," and "Time" fields become active. Either highlight a field and type to change the contents, or use the increase-decrease tab change displayed date and time values. When completed, press the Update Path button 122 to activate the changes. This process is allowed between market close (:40) and transaction start-ramp (:55).

A marked up version of the paragraph replacing the redacted paragraph that begins on page 13, at line 19 follows:

[Once] As shown in Figure 13, once the user has entered the system, the Market Open dialogue box 124 appears, if the market is open. If the market is closed, a blank Market View window is displayed. At the top of each trading hour, CPEX provides the user with both visual and audible notification that the market is open. The Market Open dialogue box 124 presents for confirmation the transmission import and export limits at

each interface for the next hour. If the Participant agrees with the listed limits, he selects the Confirm button 126. Based on his current operating conditions, the user may change the Limit In or Limit Out value to any number from zero up to the Max In or Max Out value, respectively, for any interface. The interface limits must be confirmed each hour before a user is allowed to buy or sell energy using CPEX. For the purpose of wheeling, however, the displayed interface limits remains in effect and available for use by other Participants until new limits are entered. The default interface limits displayed by CPEX in the Market Open dialogue box 124 are set by the user in the future Markets Setup screen and may be changed at any time by the user in the Transmission tab of the Transmission View screen.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 14, at line 11 follows:

[Figures 14 to 27] Figures 14, 15a-15e and 16 to 27 illustrate the various features of the Market View screen 128 which displays transaction and transmission data for either the Current Hour or the Next-Hour. The Market View display 128 enables a Participant to submit offers to buy and sell energy, to accept other Participant's offers to buy and sell energy, and to view and curtail confirmed schedules. The Transmission View enables a user to monitor and change transmission interface limits and wheeling rates. After logging into CPEX and confirming transmission limits, CPEX defaults to the Market View display 128 shown in Figure 14. The Current button 130 and Next button 132 centered at the bottom of the display indicates whether the information displayed is Current Hour or Next-hour. The Market View display 128 contains two panels 134, 136 with duplicate capabilities. The purpose of this ease-of-use feature is to provide the simultaneous display of two CPEX screens. Attached to each of the two panels are five tabs. Buy 138 allows the user to submit, view, or withdraw offers to buy energy. Sell 140 allows the user to submit, view, or withdraw offers to sell energy. Buy Market 142 allows the user to view or accept other Participants' offers to sell energy. Likewise, Sell Market 144 allows the user to view or accept other Participants' offers to buy energy. Schedule 146 allows the user to view or curtail scheduled transactions. Below the two panels in the Market View display 128 is the "dashboard", which contains several displays summarizing the Participant's ongoing CPEX activity. The dashboard is divided into three sections: Schedule List 148, Total/Net Activity Summary 150, and Interface Usage Bar Chart 152.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 15, at line 12 follows:

The Total/Net Activity Summary 150, shown in Figures 15b to 15d, displays the total and net transaction activity. This total and net activity may be displayed in any of three views: Text, Graph MWH, and Graph \$. The different views may be selected using the radio buttons (154, 156 and 158) below the Total/Net Activity Summary 150. The Text view, Figure 15b, displays the various information. Buy indicates the Total Quantity (MWh) and Cost (\$) of all energy purchases for either the Current or Next-hour. "PI" indicates the Participant's Performance Index for most recent 100 energy purchases and sales. This Index indicates how many of the most recent 100 transactions, in which the Participant was a buyer or seller, were not curtailed by the Participant. Sell indicates the Total Quantity (MWh) and (Revenue) (\$) of all energy sales of either the Current or Next-hour. Net indicates the Net Quantity (MWh) and Cost/(Revenue) (\$) of all energy bought and sold for either the Current or Next-hour. Wheel indicates the Total Quantity (MWh) and (Revenue) (\$) from wheeling energy for either the Current or Next-hour.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 16, at line 17 follows:

The Interface Usage Bar Chart 152, shown in Figure 15e, graphically displays both available and scheduled interface capacity (MW) into ("In") and out of ("Out") each of the Participant's interfaces. The MW values across the top are automatically scaled to accommodate user-input interface limits. The first color bar indicates unscheduled and, for the Next-hour, available interface capacity. A second color bar indicates the scheduling of the Participant's own energy purchases or sales across the interface, while a third color bar indicates the scheduling of wheeling.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 17, at line 2 follows:

At the bottom of the [display] Market View display 128 are several other options. Transmission displays Transmission View, discussed in greater detail below. When Transmission View is displayed, this becomes the Market button used to toggle back to the Market View. Future Market displays Future Market Setup. Reveal displays Current

or Next-hour schedule revealing the identities of all parties to each transaction. US Map displays the Participant Connections diagram. Reports displays the Reports menu. Logout logs the user out of CPEX. Help displays the Help menu.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 18, at line 1 follows:

If confirmed, the offers are communicated and available to all Participants for which a feasible transmission scheduling path exists. Upon selecting the Confirm button 166, the Offer - Not Yet Taken table in the Buy tab of the Market View is updated to reflect the offer just submitted to the marketplace. As shown in Figure 19, offers 170 are now displayed in the right menu. For example, the offer is for the sale of 20 MWh at \$15.00/MWh. This offer is for "interruptible" energy. In other words, if a buyer accepts this offer, he must be prepared to have the supply of this energy interrupted if the Seller needs the energy to supply its own user base. For these offers submitted but not yet accepted by another Participant, the number of viewers 172 indicates the number of Participants for which a feasible contract path exists to schedule the transaction. In the example above, there are 14 other Participants that can view and, if desired, accept the user's offer(s) to buy energy.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 19, at line 1 follows:

Figure 20 illustrates the software generated screen displayed when the user selects the Sell Market tab in the left panel and the Buy Market tab in the right panel. Participants' offers to sell energy in the Buy Market table are displayed in "best-cost" (ascending) order based on the \$/MWh price. Participants' offers to buy energy in the Sell Market table are likewise displayed in the "best-cost" (descending) order. Offers displayed in each table are available to the user and reflect a deliverable price and quantity of energy. Using the radio buttons at the top of each panel, the user may designate whether he wishes to view interruptible or non-interruptible energy offers. As many as 40 offers may be displayed in each table at any one time. Information is displayed for each offer in the Sell Market and Buy Market. MWh indicates the quantity of energy offered for sell or purchase. \$/MWh indicates the price of energy net of any applicable wheeling charges. CPEX determines the least cost, feasible contract path for

scheduling each transaction. For sell offers in the Buy Market table, this price includes any wheeling charges. For buy offers in the Sell Market table, this price represents the net revenue available to the user net of any wheeling charges. # of Viewers indicates the total number of Participants for whom a feasible contract path exists over which to schedule the transaction. "PI" indicates the Performance Index of the offer that acts as a reliability indicator. This Index reflects the recent tendency of parties to an offer (e.g., buyer/seller and/or wheelers) to curtail transactions. As previously described, CPEX maintains both a buy/sell PI and a wheeling PI for each Participant. The buy/sell PI represents the number of times out of the most recent 100 transactions for which the Participant was a Buyer or Seller that it did not initiate curtailment. For example, if a Participant curtailed eight out of the most recent 100 transactions for which it was a Buyer or Seller, its buy/sell PI would be 92. Similarly, if a Participant curtailed three of the most recent 100 transactions for which it was a Wheeler, its wheeling PI would be 97. For transactions involving no wheelers, the PI associated with an individual offer is the Buyer's or Seller's buy/sell PI. For transactions involving wheelers, the PI associated with an individual offer is the product of every Wheeler's wheeling PI and the Buyer's or Seller's buy/sell PI:

Buyer/Seller PI		Wheeler 1 PI		PI of the Offer
.92	x	.97	=	.89

Interface indicates the interface over which the transaction would be scheduled if the offer were accepted. This interface is on the lease-cost path available for scheduling the transaction.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 20, at line 9 follows:

Within the Buy Market and Sell Market tabs, two buttons are available to the user for acting on the offers. The Buy/Sell button 176 accepts, upon confirmation, the selected offer(s) to buy or sell. Up to three offers to buy or sell may be selected at one time. The Filter button 178 allows the user to specify MWh and/or \$/MWh criteria for displaying offers in the Buy Market or Sell Market tables. To accept an offer(s) to buy or sell, the user selects the desired offer(s) in either the Buy Market or the Sell Market table and presses the Buy or Sell button, respectively.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 21, at line 2 follows:

After pressing the Confirm button, the Market View is updated to reflect the acceptance of the two offers, as shown [below] in Figure 23. First, the two offers accepted are no longer available to Participants and are removed from the Sell Market table. In addition, each of the three displays in the Activity Summary, or "Dashboard," are updated. The Schedule List shows the two transactions just accepted and the Total/Net Activity Summary indicates total sales of 77 MW generating \$1,238 in revenue. The Interface Usage Bar Chart reflects the effect of the two transactions on available interface capacity. Both the SIPC and the IPC "Out" interface capacity bar chart are partly shaded GREEN to indicate the scheduling of sales across those interfaces.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 21, at line 10 follows:

To increase the effectiveness of CPEX for each Participant, a Filter button 184 is provided for both the Sell Market and the Buy Market tables. This feature enables the user to screen, or "filter," offers in the Buy Market or Sell Market tables. When the user presses the Filter button 178, the dialogue box shown in Figures 24 and 25 appears. If the user is, for example, unable to buy more than 75 MW of interruptible energy for the Next-hour and unwilling to pay more than \$17.50/MWh for that energy, he may filter the offers to reflect those parameters. This is accomplished using the ">=" and "<=" radio buttons 186 and MWh and \$/MWh data entry fields 188, 190 as shown in the dialogue box [below] of Figures 24 and 25. If the user wishes to cancel the filter entries and return to the Buy Market, he may press the Cancel button. If the user wishes to implement the filter entries, he may press the Accept button. Upon pressing the Accept button, the Buy Market table [196] 192 is updated to reflect the new filter criteria as shown in Figure 26. Unless changed by the operator, these filter criteria apply to both the interruptible and the non-interruptible offer tables in this Buy Market panel. However, the Buy Market tab may also be selected in the left-side panel of CPEX, the non-interruptible radio button 194 selected, and a different set of filter criteria input and applied to that Buy Market table. All filter criteria remain in effect until changed by the user.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 22, at line 4 follows:

The Schedule tab 196 displays information concerning each consummated Buy and Sell transaction of the Participant for either the Current or Next-hour. Figure 27 illustrates the software generated screen displayed when the Schedule tab 196 is selected in the right side panel. For each buy and sell transaction, the Schedule tab [198] displays information 198 for the transaction. MWh indicates the quantity of energy bought or sold. \$/MWh indicates the price paid for energy purchases or price received for energy sales. N/I indicates whether the energy sale is non-interruptible or interruptible. Interface indicates which interface over which the transaction is scheduled for the Current Hour or will be scheduled for the Next-hour. From the Schedule tab, individual buy or sell transactions may be curtailed as necessary using the Curtail button 200.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 25, at line 19 follows:

Figure 33 illustrates the software generated Future Markets Setup screen which enables the user to store default values for transmission service (wheeling rates) and transmission (interface) limits, as well as offers to buy and sell energy. This screen is accessed by selecting the Future Market button 214 on the Market View screen, as shown in Figure 31. The values displayed in the Future Market setup take effect at the beginning of the Next-hour and every hour thereafter unless the values are changed in the Future Market Setup. To change a transmission (wheeling) service charge for subsequent hours, the user selects the desired interface and enters the new rate for the appropriate wheeling path in the upper right panel of this display. At the beginning of the hour, this new rate will be displayed in the \$/MWh column of the Link display. To change transmission (interface) limited for subsequent hours, the user selects the desired interface and enters the new Limit In or Limit Out value in the lower right panel of this display. When the market opens for the Next-hour, the revised limit is reflected in the interface limits table of the Market Open dialogue box and in the Transmission table of the Transmission View. The user may also store buy and sell offers in the Future Market Setup, as the upper and lower left panels of the display indicate. When the market opens Next-hour, these offers are "pre-loaded" in the Participant's Buy and Sell tabs of the Market View. The user must then press the Send button within the Buy or Sell tabs to

submit these offers to the marketplace; otherwise, the offers are not displayed to any other Participants. The user may edit information (MWh, \$/MWh, N/I or Usage Fee) about these "pre-loaded" offers in the Buy or Sell tab prior to submitting the offer to the marketplace. "Pre-loaded" offers may also be deleted.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 28, at line 18 follows:

Referring to [Figure 37] Figure 36, a transaction involves a Buyer 230, Seller 232, and two wheelers 234, 236. If the Buyer curtails a current hour transaction, the Buyer would select [the] either the Schedule tab of the Market View or the Schedule Summary provided upon market closing. The Buyer then selects the Current Hour transaction to be curtailed and presses the Curtail Button 200, shown in Figure 27. The Initiate Curtail dialogue box 240, shown in Figure 37, appears. Because the transaction is already underway, the Operator must specify the start time 242 for ramping out the transaction as well as indicate whether the ramp will be accomplished immediately or over 10 minutes 224. The ramp start time defaults to the next minute and the ramp time defaults to 10 minutes. CPEX performs the necessary integration to determine the total energy (MWh) purchased and total cost (\$) of that purchase using the designated ramping parameters and displays 246 the results. When completed, the Operator presses the Confirm button 248 and CPEX immediately notifies the other parties to the transaction of the curtailment. If the Operator wishes to discontinue the curtailment, he may press the Cancel button 250 to terminate the curtailment process.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 30, at line 10 follows:

Figure 42 [to illustrate] illustrates a wheeler initiated curtailment involving two transactions involving [two different Buyers, the same Seller, and the same two wheelers] two separate Buyers 230, 231, the same Seller 232, and the same two Wheelers 234, 236. If Wheeler 1 were to experience the loss of the transmission line(s) with Wheeler 2, Wheeler 1 may proceed to curtail all transactions scheduled across that interface. In the Transmission Tab of the Transmission View, shown in Figure [42] 43, Wheeler 1 selects the Current Hour Market Limit In and Out for the IPC interface, enters zero for both, and presses the Update button 262. Because the updated Market Limit In for the interface is

now Zero MW and lower than the total Scheduled Activity 264 of 117 MW, transactions curtailment is necessary. CPEX identifies the transactions scheduled over the interface to be curtailed based on the following list by increasing priority: (1) Interruptible Purchase/Sale Transactions; (2) Wheeling for Interruptible Purchase/Sale Transactions; (3) Wheeling for Non-Interruptible Purchase/Sale Transactions; and finally (4) Non-Interruptible Purchase/Sale Transactions. Within each priority class, transactions are identified for curtailment in chronological order. In other words, the last transaction consummated during the trading hour is the first transaction identified for curtailment.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 31, at line 2 follows:

If a curtailment is required, CPEX identifies the transactions to be curtailed, as shown in the Initiate Curtail dialogue box 266 shown in Figure 44. In this example, both wheeling transactions scheduled into IIGE from IPC must be curtailed. Because the transactions are already underway, the Operator must specify the start time 268 for ramping out the transactions as well as indicate whether the ramp will be accomplished immediately or over 10 minutes 270. The ramp start time defaults to the next minute and the ramp time defaults to 10 minutes. In this example, the curtailment is being triggered by an equipment outage which has already occurred. The Operator, therefore, may specify an immediate ramp. CPEX performs the necessary integration to determine 272 the total energy (MWh) wheeled and total wheeling revenue (\$) earned using the designated ramping parameters. When completed, the Operator presses the Confirm button 274 and CPEX immediately notifies the other parties to the transactions of the curtailments. If the Operator wishes to discontinue the curtailment, he may press the Cancel button 276 to terminate the curtailment process.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 34, at line 6 follows:

Figures 58 to 60 illustrate a next hour curtailment initiated by a wheeler. Two transactions involve [two different Buyers, the same Seller, and the same two wheelers] two separate Buyers 230, 231, the same Seller 232, and the same two Wheelers 234, 236. If Wheeler 1 were to experience the loss of the transmission line(s) with Wheeler 2, Wheeler 1 may proceed to curtail all transactions scheduled across that interface in both

the Current Hour and Next Hour. In the Transmission Tab of the Transmission View, as shown in Figure 59, Wheeler 1 selects the Next Hour Market Limit In and Out for the IPC interface, enters zero for both, and presses the Update button 278. Because the updated Market Limit In for the interface is now Zero MW and lower than the total Scheduled Activity 280 of 117 MW, transaction curtailment is necessary. CPEX identifies the transactions scheduled over the interface to be curtailed base on the following list by increasing priority: (1) Interruptible Purchase/Sale Transactions; (2) Wheeling for Interruptible Purchase/Sale Transactions; (3) Wheeling for Non-Interruptible Purchase/Sale Transactions; and finally (4) Non-Interruptible Purchase/Sale Transactions. Within each priority class, transactions are identified for curtailment in chronological order. In other words, the last transaction consummated prior to the interface limit reduction is the first transaction identified for curtailment.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 34, at line 20 follows:

If a curtailment is required, CPEX identifies the transactions to be curtailed, as shown in the initiate Curtail dialogue box 282 in Figure 60. In this example, both wheeling transactions scheduled into IIGE from IPC must be curtailed. Because the transactions are not yet underway, the Operator need not specify ramping information. The Operator presses the Confirm button 284 and CPEX immediately notifies the other parties to the transactions of the curtailments. If the Operator wishes to discontinue the curtailment, he may press the Cancel button 286 to terminate the curtailment process. Wheeler 2 is notified of the two curtailments immediately after the curtail initiator presses the Confirm button 284. Wheeler 2 receives the respective Acknowledge Curtail notifications similar to those above. Audible notification also accompanies the messages. Pressing the Acknowledge button removes the Acknowledge Curtail messages. The Schedule Summary sent to the user at market closing reflects the curtailment by excluding the transaction from the schedule. If the curtailment of a Next Hour transaction occurs during the period between market closing and ramping, a revised Schedule Summary reflecting the curtailment is sent to the user immediately following the Acknowledge Curtail message.

A marked up version of the paragraph replacing the redacted paragraph that begins on page 36, at line 2 follows:

Figure 61 provides an illustration of the hardware required for the software. Once installed on a general purpose computer [230] 330, the software creates a special purpose machine. A typical configuration consists of a computer [232] 332 having an Intel 486DX 66Mhz CPU, 8 Megabytes of RAM, a data bus to transport data between the CPU and the memory, a power supply to operate the machine, and a 256-color, SVGA display [234] 334 to view and manipulate the screens discussed above. The computer must also have an Ethernet network card, and a router to allow the connection of a Participant's computer to the CPEX Wide-Area Network and other Participant's computers. A Keyboard [236] 336 and mouse [238] 338 can be used to enter data. Local telephone carriers install a dedicated telephone line that connects to the long distance carrier. This combination of equipment enables the dispatchers to log into the CPEX system.